Role of Ayurvedic herbs in managing Urinary System Diseases: A Review

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ABSTRACT

The urinary system plays a crucial role in eliminating waste and maintaining fluid balance in the body. However, various factors such as lifestyle, dietary habits and genetic predisposition can lead to urinary system diseases, ranging from urinary tract infections (UTIs) to more severe conditions like kidney stones and chronic kidney disease. Ayurveda, an ancient Indian system of medicine, emphasizes the balance of bodily systems through diet, lifestyle modifications and herbal remedies. According to Ayurveda, urinary system diseases are often manifestations of imbalances in the body's Doshas Vata, Pitta and Kapha. Herbal remedies are tailored to restore this balance and promote overall well-being rather than merely treating symptoms. This abstract explores the role of Ayurvedic herbs in managing urinary system diseases. Ayurveda, an ancient system of medicine offers a plethora of herbs known for their therapeutic properties in promoting kidney health, supporting urinary tract function and alleviating symptoms of various urinary disorders. Commonly used herbs include Gokshura, Punarnava, Varuna, Pashanbhed, Bijaka, Bimbi, Karavellaka, Vata, Jambu etc. each offering unique benefits such as diuretic, anti-urolithic, nephroprotective, anti-inflammatory and antimicrobial effects. Overall, Ayurvedic herbs present promising avenues for managing urinary system diseases and improving overall urinary health.

Key words: Mutrakriccha, Mutraveerajneeya, Mutrasangrahaneeya, Mutravirechaneeya, Ashmari

INTRODUCTION

Urinary system disorders are prevalent health concerns affecting millions worldwide, often leading to discomfort & impaired quality of life. Ayurveda offer a wide range of holistic treatments covering preventive, promotive, curative, rehabilitative and rejuvenators needs. Whatever we eat it has to pass through various stages like absorption, distribution, metabolism and excretion. Excretion is mainly done through urine, faeces, exhaled air, saliva, sweat and milk.

Dosha Dhathu Mala Mulam Hi Shareeram, Dosha, Dhathu and Mala are the basic substratum of the Shareera (Body).[1] Mala being one among them, Acharya’s have given importance to their function and their different status in the body. Mutra is one among the Trimala[2] and it plays a major role in Kledavahana.

In Ayurveda various types of Srotas are mentioned. Mutravahasrotas is one of them. Srotas constitute the internal transport system of body specially related to the fine circulation and pathways carrying out all the vital functions of the body. When Mutravahasrotas are vitiated due to various causes like Mutravegadharana, injury to urinary bladder, urethera, Basti Vyapada etc. it leads to development of various diseases of Mutravahasrotas like Atishrishtam Mutra (polyuria), Atibaddham Mutra (anuria), Prakupit Mutra (frequent micturation), Alpa-Alpa Mutra (oliguria), Sashool Yukt Mutra (dysuria), Bahul Mutra (frothy urine). This
review explores the role of Ayurvedic herbs in addressing urinary system diseases, focusing on their mechanisms of action & clinical efficacy.

**Urinary disorders mentioned in Brihatrayi**

<table>
<thead>
<tr>
<th>Roga (Diseases)</th>
<th>No. of Roga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mutrakriccha</td>
<td>08</td>
</tr>
<tr>
<td>Mutraghata</td>
<td>13</td>
</tr>
<tr>
<td>Ashmari</td>
<td>04</td>
</tr>
<tr>
<td>Prameha</td>
<td>20</td>
</tr>
<tr>
<td>Mutrakshaya</td>
<td>01</td>
</tr>
<tr>
<td>Mutravriddhi</td>
<td>01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47</strong></td>
</tr>
</tbody>
</table>

**Herbs for managing Urinary System Diseases**

- Mutravirechaneeya Dravya
- Madhumehahara Dravya
- Ashmaribhedana Dravya
- Mutraveerajneeya Dravya
- Mutrasangrahaneeya Dravya

**DISCUSSION**

**Mutravirechaneeya Dravya**

Plants of Mutravirechaneeya Mahakshaya, described as 35th Mahakshaya in the 4th chapter of Charaka Samhita, Purvardha are mostly recognized for their urine inducing or urinary flow increasing capacity along with urinary system defending property in the ancient Ayurvedic medical science. Mutravirechaneeya Mahakshaya by Acharya Charaka is found to cure effectively urinary disorders like incomplete emptying, various urinary tract infections and urinary tract calculi with some herbs having the properties to preserve renal function. Acharaya Priyavrat Sharma also mentioned Mutravirechaneeya Dravya in his book Dravyaguna Vijnana (II).
Ashmaribhedana Dravya

Ashma (calculi) comprises of two words i.e., Ashma and Ari. Ashma means a stone and Ari means enemy. Mutrashmari (urolithiasis), is a disease of Mutravahasrotas (urinary tract) and involves formation of stone, resulting into severe pain as given by enemy. Herbs that break the formed stones, expel it from the body and prevent further formation of stones are known as Ashmaribhedana Dravya.

### Table 2: List of Dravya that act as Ashmaribhedana[5]

<table>
<thead>
<tr>
<th>SN</th>
<th>Dravya name</th>
<th>Latin name</th>
<th>Rasa</th>
<th>Guna</th>
<th>Vipaka</th>
<th>Veerya</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pashanabheda</td>
<td>Bergenia ligulata</td>
<td>Kashaya, Tikta</td>
<td>Laghu, Snigdha, Tiksa</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>2.</td>
<td>Varuna</td>
<td>Crataeva nurvala</td>
<td>Tikta, Kashaya</td>
<td>Laghu, Rooksha</td>
<td>Katu</td>
<td>Ushna</td>
</tr>
<tr>
<td>3.</td>
<td>Kulattha</td>
<td>Dolichos biflorus</td>
<td>Kashaya</td>
<td>Laghu, Rooksha, Tiksa</td>
<td>Amla</td>
<td>Ushna</td>
</tr>
</tbody>
</table>

Mutrasangrahaneeya Dravya

The drugs which help to restore normal quantity of urine (anti-diuretics) are called Mutra- Sangrahaneeya Dravya. Mutrasangrahaneeya Mahakashaya is given in Charaka Samhita. Acharaya Priyavrat Sharma also mentioned Mutrasangrahaneeya Dravya in his book Dravyaguna Vijnana (II).

### Table 3: List of Dravya that act as Mutrasangrahaneeya[6,7]

<table>
<thead>
<tr>
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<th>Guna</th>
<th>Vipaka</th>
<th>Veerya</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Jambu</td>
<td>Syzygium cumini</td>
<td>Kashaya, Madhura, Amla</td>
<td>Laghu, Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>2.</td>
<td>Amra</td>
<td>Mangifer indica</td>
<td>Kashaya</td>
<td>Laghu, Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>3.</td>
<td>Vata</td>
<td>Ficus bengalensis</td>
<td>Kashaya</td>
<td>Guru, Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>4.</td>
<td>Udumbara</td>
<td>Ficus glomerata</td>
<td>Kashaya</td>
<td>Guru, Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>5.</td>
<td>Ashvattha</td>
<td>Ficus religiosa</td>
<td>Kashaya, Madhura</td>
<td>Guru, Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>6.</td>
<td>Plaksha</td>
<td>Ficus lacor</td>
<td>Kashaya</td>
<td>Guru, Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
<tr>
<td>7.</td>
<td>Sala</td>
<td>Shorea robusta</td>
<td>Kashaya (Twak)</td>
<td>Rooksha</td>
<td>Katu</td>
<td>Sheet a</td>
</tr>
</tbody>
</table>
8. Sarja
Vateria indica
Kashaya (Tvak)
Kashaya, Madhura (Rala)
Rooksha Katu Sheeta

9. Dhava
Anogeissus latifolia
Kashaya Laghu, Roorksha Katu Sheeta

10. Tinisha
Ougenia ooeinens is
Kashaya Laghu, Roorksha Katu Sheeta

11. Ashman taka
Ficus rumphii
Kashaya Laghu, Roorksha Katu Sheeta

12. Vikanka ta
Flacourtia ramonch i
Tikta, Madhura, Amila, Kashaya (Phala)
Laghu, Roorksha Katu Sheeta

13. Kapeeta na
Theespia populnea
Kashaya Laghu, Roorksha Katu Sheeta

14. Bhallata k
Semecarp us anocardiu m
Katu, Tikta, Kashaya Laghu, Snigdha, Tikna Madhura Ushna

15. Somvaik ala
Acacia suma
Tikta, Kashaya Laghu, Roorksha Katu Sheeta

<table>
<thead>
<tr>
<th>SN</th>
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<th>Vipaka</th>
<th>Veerya</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Bijaka</td>
<td>Pterocarpus marsupium</td>
<td>Kashaya, Tikta</td>
<td>Laghu, Roorksha</td>
<td>Katu</td>
<td>Sheeta</td>
</tr>
<tr>
<td>2.</td>
<td>Karavellaka</td>
<td>Momordicia charantia</td>
<td>Tikta, Katu</td>
<td>Laghu, Roorksha</td>
<td>Katu</td>
<td>Ushna</td>
</tr>
<tr>
<td>3.</td>
<td>Saptachak r</td>
<td>Salacia chinensis</td>
<td>Kashaya, Tikta</td>
<td>Laghu, Roorksha Tikna</td>
<td>Katu</td>
<td>Ushna</td>
</tr>
<tr>
<td>4.</td>
<td>Bimbi</td>
<td>Coccinia indica</td>
<td>Tikta</td>
<td>Laghu, Roorksha Tikna</td>
<td>Katu</td>
<td>Ushna</td>
</tr>
</tbody>
</table>

**Mutraveerajneeya Dravya** (Urinary pigment normalizers)

Acharya Charaka in *Shadvirechanasataasriteeyam* Adhyayam has mentioned *Mutraveerajneeya Mahakashaya*. The term *Virajana* means providing colour to something. Hence *Mutraveerajneeya Mahakashaya* will be capable of correcting the colour i.e., in bringing back the *Prakruta Varna* to Mutra.

**Dosha Dushtam Mutram Viranjayita Prakrtau Sthapayati Tad Mutravirajaneeyam**

Dravyas, which reduce the *Dosa Dushti* and bring about normal *Varna* to Mutra, are known as *Mutravirajaneeya Dravyas*. In some conditions like Agnimandya and Amajeerna, the *Pachana* of Ahara and subsequent Sara Kitta Vibhajana do not take place properly leading to improper formation of urine or discolored urine. In conditions like Kamala, Pandu, Haridrameha, Manjishtameha due to *Srotavarodha* and *Dosha Dushti* urine becomes discolored.

<table>
<thead>
<tr>
<th>SN</th>
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<th>Vipaka</th>
<th>Veerya</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Padm (Ishat Shwet Kamal)</td>
<td>Nelumbum nucifera</td>
<td>Madhura Tikta, Kashaya</td>
<td>Laghu, Snigha,</td>
<td>Madhuras</td>
<td>Sheeta</td>
</tr>
</tbody>
</table>

**Madhumehahara Dravya**

The term Diabetes means that a condition in which a large volume of urine is passed and Mellitus means sweet. It is characterized by polyuria, polydipsia, polyphagia, fatigue etc. In Ayurveda Diabetes Mellitus significantly resembles with *Madhumeha*. All *Prameha* if not treated properly, may be converted to *Madhumeha* (DM) in due course of time. It is a Tridoshaja condition with dominance of *Kapha* and *Dushya* involved in it are Meda, Mamsa, Kleda, Shukra, Shonita, Vasa, Majja, Lasika, Rasa and Oja. The drugs which are useful in treating *Madhumeha* are called *Madhumehahara Dravya*.
Probable mode of action & experimental evidence of some herbs

I) Probable Mode of Action of Mutavirechaneeya Dravya

Yat Dravyam Mutrasya Atipravartanam Karoti Tat Mutavirechaneeyam

The Dravyas which increases the urine formation are called Mutavirechaneeya Dravya. As most of the Dravya are Madhura Rasa and Sheeta Guna they increase the Jaliyansha. Increase in formation of Jaliyansha leads to urine formation.

- As we know drugs which increase the formation of Mutra are predominant in Jala (Sheeta Veerya) e.g., Goksura, Kusha, Kasa, Sara, Iksku, Bhumyamalaki, Vandaka, Tripusha, Pashanbhed and Agni (Ushna Veerya) Mahabhoot e.g., Punarnava, Kankola, Hapusha, Vashir. So, both Ushna Veerya and Sheeta Veerya drugs cause diuresis.

- Sheeta Veerya due to predominance of Jala Mahabhoot increases the water content in the Mutra and decreases the reabsorption of water in the convoluted tubules & DCT.

- Ushna Veerya (Aganya Dravya) increases the pressure in the afferent arteriole of the kidney and nephrons thereby increases the GFR, ultimately when GFR increase the urine formation also increases. Aganya Dravya also causes diuresis by causing irritation in the kidney.

Experimental evidence of Mutavirechaneeya Dravya

1. Vrikshadani (Dendrophthoe falcata)

Diuretic activity, Urinary stone formation preventing capacity

Preparation of active ingredient of Dendrophthoe falcata in the medium of water and alcohol were investigated to establish its calculi destroying capacity and aqueous preparation was experienced for urinary output enhancing capacity. When aqueous preparation of active ingredient (4 g/kg p.o.) was tested in rats and comparison made with furosemide (4 mg/kg) and hydrochlorthiazide (10 mg/kg), it showed considerable enhancement of urinary output with increased secretion of excess salts was observed. The animals in which extraction of active principle of the experiment drug (4 g/kg, p.o.) in water and alcoholic medium, there was noticed significant decrease in the weight of magnesium ammonium phosphate stones, caused by setting in zinc disc in the urinary bladder of rats.
compared to control group managed by ethylene glycol.[12]

2. Gokshura (Tribulus terrestris)

Diuretic activity
Gokshura contain potassium alkali. Watery extract of Gokshura possesses similar diuretic activity like urea both in rats and dogs. The diuresis is due to the potassium content of the extract.[13]

Antiurolithiatic activity
Glycolate oxidase (GOX) which is one of the main enzymes required for oxalate formation is prevented by Tribulus terrestris and its antiurolithiac activity is attributed to this property. The inhibition of glycolate oxidase was due to the effective ingredients of Tribulus terrestris namely quercetin and kaempherol which were evaluated to be its non-competitive and competitive inhibitors respectively.[14]

3. Vasuka (Boerhavia diffusa Linn)

Diuretic activity
It was found that β-ecdysone extracted from the root of Boerhavia diffusa is responsible for its diuretic potential.[15]

4. Vashira (Achyranthes aspera)

Nephroprotective activity
The roots are found effective in preventing calcium oxalate crystallization and its growth tested in a test tube and also effective on renal tubular epithelial cell injury in rats.[16]

Diuretic activity
Elevated diuretic efficacy was found in male rats from the Achyranthes aspera entire plant methanolic extract as evaluated by Saurabh Srivastav and coworkers.[17]

5. Pashanbhedha (Bergenia ligulata)

Antiurolithiatic activity

- Considerable decomposition of renal stone both in renal and urine component was observed from methanolic extract of Bergenia ligulata and bergenin.[18]
- Bergenia ligulata rhizome inhibited calcium oxalate crystal aggregation as well as crystal formation, diuretic and antioxidant action of Bergenia ligulata are supposed to be responsible for its antiurolithiac action.[19]

6. Darva (Imperata cylindrica)

Diuretic activity
Dubey, S.D. et al. (1985) have been studied the pharmacology of I. cylindrica in experimental albino rats and reported to have significant diuretic, natriuretic and Kaluretic actions.[20]

7. Kusha (Desmostachya bipinnata)

Diuretic activity
Considerable diuretic action and improved urinary output compared to furosemide (P<0.01) was observed for the hydroalcoholic extract of Desmostachya bipinnata. Urinary electrolytes levels (Na+, K+, and Cl) are also enhanced with this.[21]

Antiurolithiatic activity
Considerable fall in the amount of renal calcium oxalate accumulation was observed in urinary calculi formation caused test group rats in case of active ingredient extraction of Desmostachya bipinnata in water medium. Calcium oxalate stone formation caused chemical processes in living things were also setback by it.[22]

Antimicrobial activity
Significant antimicrobial activities were noticed from the important oil extracted from the aerial parts of Desmostachya bipinnata against various bacterial pathogens like S. aureus, S. epidermis, E. coli etc.[23]

8. Kasa (Saccharum spontaneum Linn.)

Antiurolithiatic activity
Ethanolic root extract of S. spontaneum has curative effect on stone formation induced by ethylene glycol.[24]

9. Gundra (Typha australis)

Antiurolithiatic activity
Roots decoction: To boil 3–6 g of dried roots in 1L of water to use 125 ml OD till stone expulsion.[25]
Diuretic activity
Gundra is studied to be as Sheeta Veerya (cooling potency), Mutrajanak (diuretic), and Pittashamak (alleviates Pitta) in character.\[^{[26]}\]

10. Sara (Saccharum munja Roxb) Antibacterial activity
Active ingredient extraction from leaf and stem of Saccharum munja was found to be antimicrobial against gram negative E. coli. A large extent of inhibitory effect was noticed from leaf and stem extract.\[^{[27]}\]

Diuretic and antiurolithiatic activity
It is applied in urinary calculi cases for its Sheeta Veerya (cold potency) and Mutrajanan (diuretic) qualities.\[^{[28]}\] In a study roots possess antioxidant and leaves have lithotriptic properties.\[^{[29,30]}\]

II) Probable mode of action of Mutrasangrahaneeya Dravya
Ati Pravrttam Mutram Yat Sangrhnaati Tat Mutrasangrahaneeyanam\[^{[31]}\]

- These Dravyas cause stoppage of excess Mutrapravritti rather than altering the normal quantity, and are hence utilized in Kleda Pradhana Vyadhi like Prameha, Shayyamutra where Mutra Atipravritti is seen. The main symptom of Prameha is Prabhoot Avil Mutrata, so by Mutrasangrahaneeya action these drugs help to treat Prameha and Madhumeha (diabetes). In such diseases medications that are Kledashoshaka, Shleshmedohara, Pramehaghna and Shleshmavatahara are required. These functions are carried out efficiently by the Mutrasangrahaneeya Dravyas.

- Most of them are Tikta, Kashaya Rasa and Ruksha Guna Pradhana e.g., Jambu, Amra, Vata, Udumbra, Ashvattha, Plaksha, Sala, Sarja, Dhava, Tinisha, Ashmantaka, Vikankata, Kapeetana. Due to Kashaya Rasa they decrease the secretions in the tubule of the kidney because Kashaya Rasa has astringent effect. Due to its Ruksha Guna they decrease the Kleda in the body ultimately decrease the urine formation.

Experimental evidence of Mutrasangrahaneeya Dravya
The drugs of Mutrasangrahaneeya Mahakashaya are advised or prescribed in the various ailments of urinary system like Prameha, Shayyamutra etc. These herbs are also helpful in other diseases like Atisara, Grahani, Raktapitta etc. which have Atipravruti (Bahirgaman) of Jaliyancha from the body. They help in rectifying Atipravruti of Mutra by directly and indirectly.

1. Amra (Mangifera indica) Hypoglycaemic activity
The effect of the aqueous extract of the leaves on blood glucose level in normoglycaemic, glucose induced hyperglycaemic and streptozotocin (STZ) induced diabetic rats has been assessed. The results indicate that the aqueous extract of the leaves of Mangifera indica possess hypoglycaemic activity. This action may be due to an intestinal reduction of the absorption of glucose.\[^{[32]}\]

2. Somvalkala (Acacia suma) Hypoglycaemic activity
The roots of Acacia suma possess the hypoglycemiac activity.\[^{[33]}\]

3. Bhallatak (Semecarpus anacardium) Hypoglycaemic activity
Arul et al. studied the effect of ethanolic extract of dried nuts of Bhallatak on blood glucose and investigated in both normal and streptozotocin induced diabetic (antihyperglycemic) rats. The ethanolic extract (100 mg/kg) reduced the blood glucose of normal rats.\[^{[34]}\]

4. Vata (Ficus bengalensis) Antidiabetic activity
A dimethoxy derivative of leucocynidin, 3-Obeta-D-galactosyl cellobioside was also isolated and its antidiabetic activity has been demonstrated.\[^{[35]}\]

5. Udumber (Ficus glomerata) Antidiabetic activity
Methanolic extract of the stem bark in dose of 200 and 400 mg/kg orally lowered the glucose level in normal
and alloxan induced diabetic rats. The activity was also comparable to that of the effect produced by a standard antidiabetic agent, glibenclamide (10 mg/kg) proving its folklore claim as antidiabetic agent.[36-38]

6. Ashvattha (Ficus religiosa)

Hypoglycemic activity
Sitosterol-D-glycoside was isolated from the root bark of F. glomerata and F. religiosa, which has a per oral hypoglycemic activity.[39]

7. Jambu (Syzygium cumini)

Antidiabetic activity
Different parts of the jambolan especially fruits, seeds and stem bark possess promising activity against diabetes mellitus and it has been confirmed by several experimental and clinical studies. In the early 1960s to 1970s, Chirvan-Nia and Ratsimamanga[40], Sigogneau-Jagodzinski et al.[41], Lal and Choudhuri[42], Shroti et al.[43], Bose and Sepha[44] reported the antidiabetic activity of various parts of jambolan in diabetic animals.

III) Probable mode of action of Ashmaribhedana Dravya

Kidney stone (Mutrashmari) is a condition that develops due to an imbalance of Vata and Kapha Dosha and this causes Sanga (obstruction in the urinary bladder) leading to problems in micturition. As in most of the Dravya there is predominance of Tikdna Guna & Tikta, Kashaya Rasa. Due to Tikdna Guna they cause disintegration of stones and prevent assimilation of Kapha Dosa. Tikta and Kashaya Rasa pacify Kapha Dosa. Due to Ruksha, Tikdna Guna and Ushna Veerya they prevent formation or accumulation of stones. Along with these actions Ushna Veerya of these drugs also aids in diuresis.

Experimental evidence of Ashmaribhedana Dravya

1. Gorakshaganja (Aerva lanata)

Antiuroliathic activity
The isolated quercetin and betulin from A. lanata have shown mild diuretic effect as well as antiuroliathic effect by significantly reducing the size of calculi in the kidneys and enhancing the excretion of calcium, phosphate, oxalate while maintaining the level of magnesium, which is reported to be one of the calculi inhibiting factors.[45]

2. Varuna (Crataeva nurvala)

Antiuroliathic activity
C. Nurvala contains active constituent Lupeol, which is very well known for its antiuroliathic activity through anti-oxaluric and anti-calciuric effect.[46]

IV) Probable mode of action of Madhumehahara Dravya

It was observed that most of the drugs possessed Katu, Tikta, Kashaya Rasa, Ushna Veerya, Katu Vipaka and Laghu, Ruksha Guna. Most of them exhibited Kapha-Pittaghna property.

Katu Rasa possess Guna like Laghu and Ruksha which aids the Shoshan of Kleda, Kapha, Mutra present in body. As Ushna Veerya being opposite to the Kapha and Kleda (Sheeta Guna) does Samprapti Vighatana. So, Dravya like Karavellaka can be used in Kaphaja Prameha.

Pitta possesses Ushna, Tikshna Guna. So, the Dravyas like Bijaka possessing Sheeta Veerya may be used in Pittaja Prameha. Kashaya and Tikta Rasa does the Kleda and Meda Shoshana. Laghu, Ruksha Guna helps to combat the Dravatah Vruddhi of the Pitta Dosa.

Experimental evidence of Madhumehahara Dravya

1. Bimbi (Coccinia indica)

Hypoglycemic activity
- The juice of the roots and leaves is used to treat diabetes and the aqueous and ethanolic extracts of the plant exhibit hypoglycemic action.[47]
- C. indica leaves have been shown to stimulate insulin secretion in diabetic rats.[48]
- Flavonoids and glycosides present in C.indica leaves are reported to have antidiabetic effects.[49]

2. Bijaka (Pterocarpus marsupium)

Antidiabetic activity
- Pterocarpus marsupium is reported to have not only hypoglycemic property but also β-cell
protective and regenerative properties, effects have been attributed to the flavonoid content in the plant.

- Complete restoration of normal insulin secretion and regeneration of beta cells have been reported in various experimental models of diabetes.

- The blood sugar lowering activity has been endorsed to be due to the presence of tannates, pterosupin, and liquiritigenin present in the plant.

- Epicatechin has been shown to have insulinogenic property by enhancing insulin release and conversion of proinsulin to insulin. Epicatechin has also been shown to possess insulin like activity.

3. Karavellaka (Momordica charantia)

Antidiabetic activity

- Bitter gourd contains bioactive substances with antidiabetic potential such as vicine, charantin, and triterpenoids along with some antioxidants.

- Studies have shown that Momordica charantia can repair damaged β-cells thereby stimulating insulin levels and also improve sensitivity/signaling of insulin.

- Bitter gourd is also reported to inhibit absorption of glucose by inhibiting glucosidase and suppressing the activity of disaccharidases in the intestine.

V) Probable mode of action of Mutraveerajneeya Dravya

As we know in Ksharameha, Neelameha, Kalameha, Haridrameha, Manjishthameha & Raktameha the mainly Dosha involved is Pitta Dosha. These drugs mainly pacify the Pitta Dosha. Most of the drugs are Madhura, Tikta & Kashaya which pacify Pitta Dosha while Tikta and Kashaya Rosa pacify Kapha Dosha. By pacifying the Pitta & Kapha Dosha these drugs help in maintaining the Prakruti Varna of Mutra i.e., reduces Aavila Mutrata.

Also, Sheeta Veerya & Madhura Vipaka of some drugs does Prasadana of Pitta & Rakta Dosha. By pacifying the Pitta & Rakta Dosha these drugs help in maintaining the Prakruti Varna of Mutra. So Mutraveerajneeya drugs can helps in-

- Normalizing urine color
- Reducing the urine turbidity
- Slight reduction in urine Ph
- Urine specific gravity
- Urine ketone bodies
- Urine protein

Clinical evidence of Mutraveerajneeya Dravya

Padm (Ishat Shwet Kamal), Utpal (Ishat Neel Kumud), Nalin (Ishat Rakt Kamal), Kumud, Soganghik (Rakt Kumud), Pundreek (Shwet Kamal), Shatpatra, Madhuk, Priyangu, Dhatki Pushpa decoction was prepared from these drugs and clinical study was conducted to assess the efficacy of Mutraveerajneeya Mahakashaya in Avilmutrata of Prameha (Type 2 Diabetes Mellitus).

CONCLUSION

Ayurvedic herbs offer valuable support in managing urinary system diseases by providing natural remedies that promote kidney function, alleviate symptoms and maintain urinary tract health viz

- Mutravirechaneeya drugs: These drugs mainly act as diuretics but can also be used as a adjuvant therapy in diseases like urinary tract infection, Benign prostatic hyperplasia (BPH), Urolithiasis, Anuria, Oliguria, Azotaemia, Retention of urine, Cystitis etc. Apart from urinary system disorders they are also helpful in oedema, ascites, pleurisy etc.

- Mutrasangrahaneeya drugs: These drugs mainly act as antidiuretics but can also be used as a adjuvant therapy in diseases like Polyuria, Diabetes insipidus, Diabetes mellitus, Urine incontinence, dribbling etc. Apart from urinary system disorders they are also helpful in Atisara, Grahani, Raktapitta, Arsha etc.
**Urinary System Function and Overall Well-being**

Incorporating these herbs singly or in combination into one’s healthcare regimen can contribute to improved urinary system function and overall well-being.

**References**


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